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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/672,013	09/26/2003	Seong Deok Ahn	2013P107	7684

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BLAKELY SOKOLOFF TAYLOR & ZAFMAN
12400 WILSHIRE BOULEVARD
SEVENTH FLOOR
LOS ANGELES, CA 90025-1030

EXAMINER

BUEKER, RICHARD R

ART UNIT PAPER NUMBER

1763

DATE MAILED: 01/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/672,013

Applicant(s)

AHN ET AL.

Examiner

Richard Bueker

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

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The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: The specification fails to provide proper antecedent basis for the subject matter of claim 13.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 4, 6-12 are rejected under 35 U.S.C. 103(a) as obvious over Jurgensen I (WO 01/61071) taken in view of Jurgensen II (WO 02/27064) and/or Gartner (4,947,790).

Jurgensen I (WO 01/61071) and Jurgensen (2003/0054099) are patent family equivalents and Jurgensen (2003/0054099) is used in this office action as an English translation for Jurgensen I (WO 01/61071). Jurgensen II (WO 02/27064) and Jurgensen (2003/0056720) are patent family equivalents and Jurgensen (2003/0056720) is used in this office action as an English translation for Jurgensen II (WO 02/27064).

Jurgensen I (see Figs. 1-6) discloses an apparatus for vapor phase deposition including process chamber, temperature controlled substrate holder, showerhead, source chambers for generating organic source vapors, transfer gas (i.e. carrier gas) source and a source heater for evaporating source material in the source chamber. Regarding claim 3, Jurgensen (see Fig. 8) teaches the use of a bubbler having the transfer gas line extending into the source chamber. Jurgensen teaches that the vaporizer of Fig. 8 can be substituted for any of the source chambers in Figs. 1 and 5. Regarding the purging step in claim 11, Jurgensen teaches (paragraphs 44 and 45) the step of providing a further feed line to feed carrier gas to the showerhead to purge the showerhead plenum when switching precursor streams. Also, Jurgensen's three-way valve 43 of Fig. 8 automatically switches carrier gas into the chamber supply line 6 when source gas flow is terminated. Claim 1 has now been amended to include the recitation of the conic block or conic plate transfer gas distributor that was previously recited in claim 5, and claim 1 has also been further amended to include the new limitation reciting that the apex of the conic block or plate is "pointing towards the transfer gas inlet". Jurgensen II teaches the use of a source chamber with a conic gas distributor plate to supply source gas to a vapor coating chamber. It is noted that the vaporizer of Jurgensen II is equivalent to that of DE 10048759 that is cited in paragraph 47 of Jurgensen I. In the source chamber of Fig. 4 of Jurgensen II, the apex of the conic plate is pointing towards the gas port 11, which Jurgensen describes as an outlet of the vessel 2 (see para. 18 of Jurgensen II). It is noted, however, that the port 11 is also an inlet to the pipe leading to the coating chamber, and transfer gas enters the port

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11, and therefore port 11 is "a transfer gas inlet" as recited in claim 1, and the apex of the conic block or plate 16 is "pointing towards the transfer gas inlet" 11. It would have been obvious to use the vaporizer of Jurgensen II in the apparatus of Jurgensen I, because the vaporizer of Jurgensen II is equivalent to that of DE 10048759 that is cited in paragraph 47 of Jurgensen I. Also, Gartner (see Fig. 3) teaches a vaporizer for vaporizing organic source vapors that is analogous to the vaporizer of Jurgensen II. Gartner's Fig. 3 vaporizer includes a conic block or conic plate 10, which is pointing towards the transfer gas inlet 6. Gartner (see col. 9, lines 23-44) teaches that his Fig. 3 vaporizer has desirable characteristics such as eliminating the formation of large cavities in the organic precursor powder, and also providing a better efficiency and flow constant. It would have been obvious to one skilled in the art to use the organic precursor vaporizer of Fig. 3 of Gartner as the organic vapor source in the apparatus of Jurgensen I in order to gain the desirable benefits of better efficiency and flow constant as taught by Gartner.

Claim 2 is rejected under 35 U.S.C. 103(a) as obvious over Jurgensen I (WO 01/61071) taken in view of Jurgensen II (WO 02/27064) and/or Gartner (4,947,790) for the reasons stated in the rejection of claim 1 above, and taken in further view of Dauelsberg (WO 01/57289). Dauelsberg (2003/0056720) is used in this office action as an English translation for Dauelsberg (WO 01/57289). Dauelsberg discloses a vapor coating apparatus of the same type as that of Jurgensen I (WO 01/61071). Dauelsberg (see Figs. 1-3 and 7 and para. 47, for example) further teaches that it is desirable to provide an inert gas flow into the coating chamber from throttle 29 to form an annular

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flow of inert gas surrounding the coating gas which flows from the center of the shower head. This annular flow of inert gas acts as a gas curtain around the coating gas, and it is a "shower" curtain because it flows from the shower head gas distributor. Also, it can be seen that the annular inert gas flow is located between the showerhead and the substrate holder, and therefore it is a shower curtain that is installed between the shower head and the substrate holder as recited in claim 2. It would have been obvious to one skilled in the art to modify the apparatus of Jurgensen I to incorporate the annular inert gas flow distributor of Dauelsberg because Dauelsberg teaches that his annular inert gas flow showerhead distributor is intended for use with a vapor coating apparatus of the type taught by Jurgensen.

Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jurgensen I (WO 01/61071) taken in view of Jurgensen II (WO 02/27064) and/or Gartner (4,947,790) for the reasons stated in the rejection of claim 1 above, and taken in further view of Ozias (4,846,102) (col. 2, lines 15-21) who teaches that vapor coating reactors are typically flushed after a coating process. It would have been obvious to one skilled in the art to purge after deposition in Jurgensen's coating apparatus for the desirable purpose of flushing unwanted gases from the reaction chamber.

Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jurgensen I (WO 01/61071) taken in view of Jurgensen II (WO 02/27064) and/or Gartner (4,947,790) for the reasons stated in the rejection of claim 1 above, and taken in view of Forrest I (5,554,220), Forrest II (6,337,102) and Posa (4,747,367). Forrest I (col. 7, lines 60-67) and Forrest II (col. 3, lines 48-61) teach that it is desirable to switch

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the gas flows in an OVPD process for depositing plural separate layers, and for that reason it would have been obvious to do so in Jurgensen's OVPD reactor.

Furthermore, Posa teaches that a vapor coating reactor that is used for depositing plural separate layers should be flushed at the end of each separate gas flow. In view of Posa, it would have been obvious to purge Jurgensen's chamber after the end of each separate gas flow.

Claims 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jurgensen I (WO 01/61071) taken in view of Jurgensen II (WO 02/27064) and/or Gartner (4,947,790), and taken in further view of Forrest I (5,554,220), Forrest II (6,337,102) and Posa (4,747,367) for the reasons given above, and taken in further view of Dauelsberg (WO 01/57289) and Konuma (2002/0030443). Dauelsberg (2003/0056720) is used in this office action as an English translation for Dauelsberg (WO 01/57289). Dauelsberg (see Fig. 9 and para. 49) teaches the use of a vaporizer in which two organic source materials are vaporized together in a heated source chamber. It would have been prima facie obvious to one skilled in the art to use Dauelsberg's two-material vaporizer for depositing one of the plural layers suggested by Forrest (I and II). Also, Konuma teaches (see Fig. 7B) that it was known to be desirable to form a plural layer organic EL device wherein an Alq₃/DCM-1 mixed layer is formed on top of an Alq₃ layer. It would have been prima facie obvious to form the Alq₃ layer of Konuma with a vaporizer of the type shown in Fig. 8 of Jurgensen and to form the Alq₃/DCM-1 mixed layer with a vaporizer of the type shown in Fig. 9 of Dauelsberg, because both types of

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vaporizer were known in the prior art to be useful for depositing organic layers for organic EI devices of the type shown in Fig. 7B of Konuma.

The rejection of claims 13 and 14 under 35 U.S.C. 112, first paragraph has been removed in view of applicants' arguments.

Applicants' arguments with respect to the conic block or plate as recited in amended claims 1 and 11 have been considered and addressed in the rejections stated above.

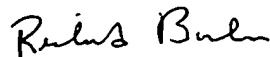
Applicants have noted that claim 2 was not addressed by a prior art rejection in the previous office action. The examiner had intended to include claim 2 in the rejection including Dauelsberg (WO 01/57289), but inadvertently did not. This has been corrected by the rejection of claim 2 stated above. For that reason, this action is not made final.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Bueker whose telephone number is (571) 272-1431. The examiner can normally be reached on 9 AM - 5:30 PM, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parvis Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Richard Bueker
Primary Examiner
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